Design and Construction Requirements

This chapter reviews and provides references to the flammable and combustible liquids standard found under Title 29, Section 1910.106 of the Code of Federal Regulations. Among other requirements, it addresses design and construction of inside storage rooms and safe handling requirements to assure employee safety for all establishments. The standard also makes reference to various tables that can help you understand these provisions. The tables show allowable quantities and maximum size specifications.

The hazards associated with the handling of either flammable or combustible liquids MUST be addressed in your hazard communication program. You should refer to your material safety data sheets for assistance in this area.

The following are some common terms and definitions that you should be aware of:

- Flashpoint
  The minimum temperature at which a substance produces enough vapor to promote combustion (be ignited). Generally, the lower the flashpoint, the greater the danger of explosion.

- Flammable Liquid
  Any liquid having a flashpoint below 100 degrees Fahrenheit (F). Flammable liquids are divided into these three classes:

  - Class IA:
    Liquids having flashpoints below 73 degrees F and having a boiling point below 100 degrees F;
  - Class IB:
    Liquids having flashpoints below 73 degrees F and having a boiling point at or above 100 degrees F; and
  - Class IC:
    Liquids having flashpoints at or above 73 degrees F and below 100 degrees F.

- Combustible Liquid
  Any liquid having a flashpoint at or above 100 degrees F. Combustible liquids are divided into these two classes:
  - Class II:
    Liquids having flashpoints at or above 100 degrees F and below 140 degrees F; and
  - Class III:
    Liquids having flashpoints at or above 140 degrees F.

Safe Practices

Safe practices on the part of employees who handle flammable and combustible liquids are essential in the prevention of fire and explosion hazards. Maintenance and operating practices at your manufacturing facility must be in accordance with established procedures designed to control leakage and prevent the accidental escape of flammable or combustible liquids. Regardless of the quantities involved, each flammable liquid used should be analyzed to determine the extent of its flammability and any health hazards associated with the liquid so that appropriate control measures can be taken.

Flammable and combustible liquids are categorized by their ease of ignition. Flammable liquids are more easily ignited than combustible ones.

Examples of flammables are:

- Acetone;
- Gasoline; and
- Lacquer thinner.

Examples of combustibles are:

- Kerosene;
- Fuel oil;
- Stoddard solvent; and
- Mineral spirits.

When flammable liquids are transferred from one container to another, for example, from a bulk container to another, they must be effectively bonded and grounded. This practice prevents electrical discharge (sparks) from the accumulation of static charge because of the transfer process.

Supplies of flammable and combustible liquids must be stored in approved, fire-resistant, safety containers equipped with flash screens and self-closing lids. All flammable liquids must be kept in closed containers when not in use. These liquids must not be al-

lowed to enter a confined space such as a pit or sewer. Employers should require that all combustible waste material (e.g., rags and shop towels that have been used for cleaning) and residues in plant or storage areas be kept to a minimum, stored in covered metal receptacles, and disposed of daily.

The quantity of liquid that may be located outside of an inside storage room or storage cabinet in a building, or in any one fire area of a building, shall not exceed:

- 25 gallons of Class IA liquids in containers.
- 120 gallons of Class IB, IC, II, or III liquids in containers.
- 660 gallons of Class IB, IC, II, or III liquids in a single portable tank.

Storage cabinets must meet National Fire Protection Association test requirements and must be properly labeled "FLAMMABLE – KEEP FIRE AWAY." Adequate aisle space must be maintained for unobstructed movement of personnel and so fire protection equipment can be brought in to any part of the flammable or combustible liquid storage area.

Design and Construction of Inside Storage Rooms

Inside storage rooms shall be constructed to meet the required fire-restrictive rating for their use. Such construction shall comply with the test specifications listed below:

- Openings to other rooms or buildings must have noncombustible, liquid-tight, raised sills or ramps at least four inches in height; or the floor in the storage area must be at least four inches below the surrounding floor. A permissible alternate to the sill or ramp is an open-grated trench inside the room that drains to a safe location. This method may be preferred if there is an extensive need to transfer flammable liquids into and out of the room by means of hand trucks;
- Any openings must have approved, self-closing fire doors;
- The room must be liquid-tight where the walls join the floor;
- An aisle at least three feet wide must be maintained in every inside storage room;
- Easy movement within the room is necessary in order to reduce the potential for spilling or damaging the containers and to provide both access for fire fighting and a ready escape path for occupants of the room should an emergency occur;
- Containers over 30 gallons in capacity cannot be stacked one upon the other; and
- Dispensing of flammables and combustibles must be by approved pump or self-closing faucet only.

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Flammable and Combustible Liquids

Open flames and smoking must not be permitted in flammable or combustible liquid storage areas.

All spills of flammable or combustible liquids must be cleaned up promptly. With major spills, remove any ignition sources, ventilate the area, and provide respirators if needed.